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VASCULAR DISEASE

IMPACT OF ATRIAL FIBRILLATION ON PLATELET-PREDOMINATE GENE EXPRESSION

ACC Poster Contributions
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Background: Platelets retain cytoplasmic mRNA and are capable of protein biosynthesis upon stimulation. Platelet release from bone marrow megakaryocytes is a flow mediated process. Changes in hemodynamics, as is seen in non-valvular atrial fibrillation (NVAF) may impact platelet RNA and protein biosynthesis.

Methods: To address the hypothesis that hemodynamic changes of cardiac rhythm impact the platelet transcriptome, 22 platelet-predominate genes expression was assessed before and 3 months after sinus rhythm (NSR) restoration by radiofrequency ablation. RNA from isolated platelets were reverse-transcribed (Invitrogen), assayed against 24 genes (TaqMan) using real-time qPCR, and expressed as mean cycle threshold (Ct) using beta-2-microglobulin and ubiquitin C asendogenous controls.

Results: 66 patients with NVAF (age 59±9.8; 32% women; 68% with paroxysmal AF) underwent successful ablation therapy. With re-establishing sinus rhythm, a significant change in gene expression was noted in 9 genes (Table). Of these, changes in insulin-like growth factor binding protein gene expression, a key regulator of platelet activity, was the most remarkable.

Conclusions: NVAF induced changes in platelet related gene expression may contribute to the thrombotic propensity of this dysrhythmia. Changes in insulin-like growth factor binding protein gene expression may provide insight to risk of thrombosis in NVAF patients with diabetes.

Gene (symbol)	Gene Expression (Mean Delta CT)*		P
	Before RFA	After RFA	
Insulin-like growth factor binding protein (IGFALS)	16.62	8.29	0.0000054
Cofilin 1 -non-muscle (CFL1)	7.737	6.348	0.000318
Platelet factor 4 (PF4)	2.83	1.588	0.000511
Glycoprotein Ib (GP1BB)	5.774	4.411	0.005248
GRB2-related adaptor protein (GRAP2)	4.155	4.678	0.008167
Integrin α2bβ3 (ITGA2B)	6.403	6.901	0.013401
Progesterone receptor component (PGRMC1)	6.091	5.655	0.014649
DD96 membrane associated protein (PDZK1IP)	6.968	6.195	0.024178
Cathepsin A (CTSA)	4.31	4.676	0.044985

*Note, the lower Ct value the higher target gene expression.